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BULLETIN

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The Smilaceæ of North and Central America.

By Thomas Morong.

The Smilaceæ have of late years been regarded as a tribe or suborder of Liliaceæ by many good botanists such as, for instance, Bentham and Hooker, and Engler and Prantl. The reasons for considering them a distinct natural family have been stated none too strongly by Mr. J. G. Baker.* Their orthotropous ovules, their peculiar stipular sheaths and tendrils, rigid and netted-veined leaves with petioles articulated near or at the blades, small umbellate and dioecious flowers, articulated pedicels which are set upon the receptacle in foveolæ, as Mr. Baker happily observes, like a ball in a socket, and flexuous, woody and often prickly stems, furnish a combination of characters which certainly separates them widely from any Liliaceous group. In addition to this, the baccate fruit of *Smilax* is entirely unique, unlike anything found elsewhere, so far as I am aware.

In the New World we have no representative of the small family Phileriaceæ, which is looked upon as a connecting link between Smilaceæ and Asparageæ; nor any species of *Heterosmilax* or *Rhipogonum*, the only other genera of the family. We are therefore restricted to the single genus *Smilax*, which is represented by 3 species in Canada, 16 in the United States, 32 in Mexico and Central America, and about 67 in South America. Enumerating only the distinct forms found in these several districts, we find about 110 species in the Western Hemisphere, or a little more than half the number ascribed by M. A. De Candolle, in his admirable monograph, to the entire world.

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* Journ. Linn. Soc. 14 : 510.

In this paper I take no notice of the species occurring in the West India Islands, about a dozen in number, except the few which have crept across the water to our coasts.

In my account of the Mexican and Central American species, in cases where I have been unable to study specimens, I have drawn freely upon the descriptions of Schlechtendal,* Kunth† and especially that great storehouse provided by M. De Candolle.‡ The last author has in his general preface so thoroughly canvassed the structure of the leaves, the inflorescence, flowers, fecundation, dissemination, and geographical distribution of the species, that little or nothing can be added upon these points. The rootstocks, tubers, and fruit of *Smilax* have scarcely been touched by any but American authors, and therefore more extended remarks upon these will be allowable.

SMILAX L. Sp. Pl. 1028 (1753).

The genus, at least so far as the species of this country are concerned, are most conveniently divided into two groups, those which are annual, with herbaceous and unarmed stems, and those, by far the greater number, which have woody, perennial stems, more or less armed with prickles. Most of the species climb upon other shrubs and trees by means of a pair of tendrils which grow at the summit of a stipular wing § on each side of the petiole, often not developing till the stem is several years of age. Blades 3–9-nerved, mostly coriaceous, at least when old, separating from the petiole above the tendrils, entire, denticulate or spiny upon the margins, and sometimes upon the nerves also. Flowers usually greenish yellow, small, dioecious, in peduncled umbels. Pedicels upon a globular or oval receptacle, in pits or foveolæ, from which they fall out at maturity, bearing the fruit with them.

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* Linnæa, **18**: 446–455. 1844.

† Enum. **5**: 160–270.

‡ Monog. Phan. **1**: 1–212.

§ De Candolle regards this appendage as more in the nature of a modified leaf-segment or leaflet than a stipule, but it seems to me that a stipule is nothing else than a leaflet at the base of a petiole.

Segments of the perianth 6, in 2 series, the inner and outer nearly equal, commonly larger than the stamens. Stamens 6 or more; anthers introrse, basifixed, 2-celled, the cells separated by a very narrow septum, appearing 1-celled when open; filaments free, attached to the base of the perianth. Staminate flowers without the rudiment of an ovary. Pistillate flowers usually smaller than the staminate, with 3 or more abortive stamens, termed staminodia by some; ovary 3-celled, each cell 1–2-ovuled; style very short or none; stigmas rather thick, recurved. Fruit baccate, globular or ovoid, 1–6-seeded, red or bluish-black when ripe. In structure the berry is very peculiar. Taking that of *S. rotundifolia,* a common northern species, by way of illustration, we find externally a thin, shining coat, separable from the inner parts. Beneath this lies a thin reddish pulp, through which three strengthening bands or ribs run from the base to the apex, uniting with each other like hoops. That these ribs are not intended to separate the cells is shown in the fact that they run across the backs of the seeds along the middle, and not along the dividing lines of the cells. They serve to impart firmness to the softer parts of the berry and to support the exterior coat. Just below the pulp, but separate from it, lie from one to several hyaline elastic sacs, one enclosing each seed, appearing like so many cells. These sacs are rubber-like, and so elastic that they may be stretched many times their length without breaking. According to a Texas correspondent of Mr. E. E. Sterns* this curious property is so noticeable in *S. Bona-nox* that it has led to the popular name "Stretchberry," by which that species is there known. It has been much disputed whether these sacs are in the nature of a test or an aril.† That they are no part of the proper perianth, but adjuncts of the seeds, seems plain enough, but so far as I can see, they are neither aril nor test, but simply seed envelopes, although it may be hard to say what purpose they subserve in the economy of the plant. Beneath the sacs, between them and the seeds, is another pulpy mass, which is attached to the hilum, covering about one-half of the seed. This has to my eyes all the appearance of a true aril, as it looks like a growth formed subsequently to the fertilization. Seeds with a brownish shining sometimes rough test, enclosing a hard, horny, white albumen, at the tubercular end of which lies a minute, straight embryo, more or less remote from the hilum. When there is only a single seed it is spherical, when several they are hemispherical or present two faces running to an edge, with convex backs.

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* Bull. Torr. Club, 15: 162.

† Mr. Sterns in the article referred to has discussed the subject in a fresh and original way. He inclines to the opinion that the sacs here spoken of are to be considered as test and not as aril.

The rootstocks are, in many of the species, at least, tuberous, throwing out firm fibrous roots. These will be noticed in the specific descriptions.

The prophylla or bud scales are numerous upon the tubers, the rootstocks and the lower part of the stems, occurring also under each branch. They are semi-amplexicaul, thick, ovate, and seldom expand into true leaves until the plant is fully developed.

The prickles do not furnish characters to be depended upon. They may always be presumed to be present normally in the woody species, but owing to poverty of growth or other circumstances, they are often wanting, especially on the branches and branchlets. Frequently species that produce them abundantly in some plants will be entirely destitute of them in others. They may be stout and strong, or weak, straight or a little recurved, terete or flat, numerous or scanty, white or black-tipped, and that in the same species. The only specific character to be drawn from the prickles lies in the shape, being acicular or needle-shaped in some species and broad-based and stout in others. When a species of this group is said in the following descriptions to be unarmed, it must be understood that only the specimens examined are unarmed.

* Stems annual, herbaceous, unarmed.

1. SMILAX HERBACEA L. Sp. Pl. 1030 (1753).

S. pulverulenta Michx. Fl. Bor. Am. 2: 238 (1803).

S. peduncularis Willd. Sp. Pl. 4: 786 (1806).

S. lasioneuron Hook. Fl. Bor. Am. 2: 173 (between 1834 and 1840).

Coprosmanthus herbaceus and *C. peduncularis* Kunth, Enum. 5: 265 (1850).

Rootstocks tuberous, the tubers resembling those of Solomon's Seal. Tubers short, thick, each of them throwing out in turn a short ligament upon which is a new tuber from which the next year's stem is evolved, the old plant dying down to the ground at the end of the season. Each stem leaves a circular scar, and many generations are successively attached to each other. One gathered recently by the writer exhibited 15 such scars, showing the rootstock to be at least that number of years old.

Stems glabrous, often glaucous, climbing by tendrils 3°–10°, obtusely angled or terete, commonly branching. Leaves distichous. Petioles varying in length from 4″ to 3½′. Blades ovate, broadly ovate, rounded or lanceolate, obtuse or cordate at base, acute, acuminate or cuspidate at the apex, frequently downy beneath (var. *pulverulenta*, A. Gray), smooth or denticulate on the margins, copiously lineolate, 7–9-nerved and sometimes with an additional obscure marginal nerve on each side, the orbicular forms 2′–3′ long, and 1½′–3¼′ wide; the ovate 2½′–5′ long and 1½′–3½′ wide; the lanceolate (var. *Simsii*. A. DC.) 1½′–3′ long and 10″–15″ wide. Peduncles 4′–9′ long, usually much longer than the petioles (6–10 times), 15–80-flowered, flattened, thickening in fruit; stipular sheaths commonly not over 2″–3″ in length, sometimes elongated with age to 10″. Pedicels 3″–8″ long. Flowers carrion-scented in anthesis. I can detect no odor in the leaves or flower buds. Segments of male perianth 2″–2½″ long, ¼–⅓ longer than the stamens. Stamens 6, occasionally 5 or 7; filaments 2 or 3 times as long as the anthers. Female flowers smaller; staminodia very apparent. Ovary ovoid, about 2″ long, 3-celled, 2 ovules in each cell; stigmas short, ovate, apparently sessile. Berries globose, bluish-black, 2–4-seeded, 3″–4″ in diameter, usually very abundant.

Woodlands, New Brunswick to Ontario and Dakota, south to Florida, Nebraska and Louisiana.

The form called *lasioneuron* by Hooker occurs in the Saskatchewan region. April–June.

2. SMILAX ECIRRHATA (Engelm.) S. Wats.; A. Gray, Man. Ed. 6, 520 (1890).

Coprosmanthus herbaceus var. *ecirrhatus* Engelm.; Kunth, Enum. : 266 (1850).

Coprosmanthus herbaceus Chapm. Fl. S. States, 477 (1860), not Kunth.

Smilax herbacea Ell. Bot. S. C. and Ga. 2: 702 (1824), not L.

Smilax herbacea var. *ecirrhata* A. DC. Monog. Phan. 1: 52 (1878).

This species is closely allied to No. 1 and resembles it except in the following particulars:

Stem simple, low, erect, without tendrils or with only a few in the uppermost axils, 6′–12′ high, or sometimes twice that height. Leaves often verticillately massed at the top of the stem. Stipular sheaths none, or rarely there is a mere thin-edged enlargement of the base of the petiole, erose-denticulate on the margins. Blade usually pubescent beneath, more or less pubescent-ciliate on the margins, mucronate at the apex. Peduncles springing from oblong scales below the leaves, or from the lowest axils. Anthers from one-half to nearly as long as the filaments.

Virginia to Florida, west to Ohio and Minnesota. May–June.

3. SMILAX TAMNIFOLIA Michx. Fl. Bor. Am. 2: 238 (1803).

Coprosmanthus tamnifolius Kunth, Enum. 5: 267 (1850).

Glabrous. Stem terete or obtusely angular. Leaves and tendrils numerous. Petioles 6″–1½′ long; sheaths none or only 1″ long, not winged. Blades for the greater part ovate-hastate, with broad, obtuse lobes at the base, slightly constricted in the middle, varying to ovate-lanceolate, truncate or subcordate at base, acute or obtuse and cuspidate, sometimes acuminate at the apex, smooth on the margins, 5–7-nerved, 15″–3′ long and 6″–2′ broad at the base. The leaves are green on both sides, commonly copiously lineolate, the nerves prominent in both sides, and the 3 midnerves often close together and nearly parallel. Peduncles nearly filiform, 1–3 from the same axils, terete or angled, often flattening in drying, usually much longer than the petioles, 1′–4′ long, 10–30-flowered. Perianth-segments of male flowers ovate, obtuse, ¾″–1¼″ long, slightly pubescent on the tips, a little longer that the stamens, obscurely 3-nerved. Stamens 6; anthers as long as the filaments or not more than one-half as long. Pedicels 2″–3″ in length. Pistillate flowers not seen. Berries black, globose, 2″–3″ in diameter, 1–3-seeded.

Dry pine barrens, New Jersey and Pennsylvania to South Carolina and Tennessee. May–July.

* Stems perennial, woody, more or less prickly.
† Berries black or bluish-black.
‡ Fruit ripening the first year.

4. SMILAX GLAUCA Walt. Fl. Car. 245 (1787).

Smilax spinulosa J. E. Smith, Rees' Cyc. 33: (1819).

Rootstock running deep into the ground, conspicuously knotted and tuberous. Tubers large, ovoid, often 1′–1½′ long and 1′

thick, composed of 2 or 3 nodes, frequently massed together conglomerately, and throwing out numerous, strong fibrous roots.*

Stem terete, the branches and branchlets angled, often somewhat quadrangular, armed with rather stout, scattered or numerous prickles which are straight or a little recurved, sometimes flat; more commonly the branches are naked. Petioles 3″–6″ long Blades glaucous beneath and sometimes also above as well as are the branches, commonly ovate, sometimes oblong-lanceolate or slightly panduriform, rounded or occasionally cordate or subcordate at base, abruptly acute or cuspidate at the apex, smooth on the margins, lineolate or often opaque, 1½′–6′ long, ½′–5′ wide, mostly 5-nerved, occasionally with an additional obscure marginal nerve on each side. Peduncles flattened, 6″–16″ long, 6–12-flowered. Pedicels 2″–4″ long. Segments of the male perianth ¼ to ⅓ longer then the stamens. Anthers longer than the filaments. Berries bluish-black, shining, about 3″ in diameter, 2–3-seeded.

Smilax spinulosa J. E. Smith (Torr. Fl. N. Y. **2**: 303), is a form of this species quite common on Staten and Long Islands, and in other parts of New York. It is distinguished by the numerous small prickles on the lower part of the stem, and leaves often elongated or slightly panduriform. The leaves of *S. glauca* are often clothed below with a minute scurfy pubescence, as well as a glaucous bloom. The berries also are frequently glaucous, especially in dried specimens not fully mature.

In general the species may be readily recognized by its ovate 5-nerved, strongly glaucous leaves, and its comparatively few flowers and fruit and short pedicels.

Dry or sandy grounds. Nantucket to Florida and Texas, west to Kansas. Occurs also in Mexico. May–June.

5. SMILAX ROTUNDIFOLIA L. Sp. Pl. 1030 (1753).

Smilax caduca L. Sp. Pl. 1030 (1753).

Smilax quadrangularis Muhl.; Willd. Sp. Pl. **4**: 775 (1806).

Rootstocks running for a long distance just under the surface of the ground, sparingly furnished with tubers like those of *S. glauca*, but seldom massed as in that species.† Glabrous. Stem

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* These tubers are described and figured by Mr. Theodore Holm in "Contributions to the knowledge of the germination of some North American plants," Memoirs Torr. Club, **2**: 84. *f. 124–126.*

† The tubers of this species are described and figured in the work of Mr. Holm, above cited.

terete, the branches and shoots frequently sharply 4-angled (var. *quadrangularis* A. Gray), climbing from 10 to 20 feet, often forming dense thickets. Prickles scattered, stout, straight or a little recurved, sometimes black at the apex, often wanting on the branches. Petiole 3″–6″ long, sheathed from ⅓ to ½ of its length, the sheath with narrow, membranous, even or ciliolate margins. Blade rotund or ovate, varying to lanceolate, abruptly acute or acuminate and cuspidate at the apex, rounded or cordate at the base, smooth on the margins or often erosely denticulate as well as on the nerves beneath and on the petiole (especially in var. *crenulata*, Small and Heller), 2′–6′ long and 10″–6′ wide, 5-nerved, or sometimes with an obscure marginal nerve on each side, also often lineolate and always punctate. The young leaves are usually quite thin, while the older are coriaceous, green and shining on both surfaces. The oldest often become very large, orbicular, and remain evergreen on the plant over winter. Peduncles 3″–12″ long, flattened, 6–25–flowered. Peclicels 1″–4″ long. Flowers greenish yellow. Perianth segments oblong, acute, often 1–nerved, pubescent at the tip and sometimes along the edges, about 2″ long. Anther about ½ as long as the filament or less. Stigmas 3, linear, as long or nearly as long as the ovary; ovary 3-celled, each cell 2-ovuled. Berries from 5 to 8 in number, bluish-black, globose, about 3″ in diameter, 1–3-seeded.

A peculiar form was collected by the late Dr. Vasey in Washington, D. C., which has rather thin, exactly orbicular leaves, 2¼′ in diameter, male perianth with segments 3″–3½″ long, ⅓ to ½ longer than the stamens, some of the anthers as long as the filament, female flowers with segments 2″ long, and an ovary apparently with only 1 ovule in each cell.

Dry or moist thickets. Ontario to Florida and Texas, west to Arkansas and Minnesota. April–June.

6. SMILAX HISPIDA Muhl.; Torr. Fl. N. Y. 2: 302 (1843).

Smilax hispida Muhl. Cat. (1813), name only.

Glabrous. Stem terete below, subterete or angular on the branches, commonly thickly hispid with numerous slender, straight spines of different lengths, which are often black, occasionally flat, sometimes 4″ long. Petiole 4″–9″ long, rarely denticulate, the stipular sheath with broad membranous denticulate margins covering from ⅓ to ½ half its length. Blade thin, green on both sides, broad-ovate, obtuse or subcordate at baes, cuneate at the petiole, abruptly acute and cuspidate at the apex, rarely destitute of denticulations on the margins and nerves beneath, lineolate, 7–9-nerved, 2′-5′ long, 1′–4¾′ wide. Peduncles

9″–2′ long, flattened, 10–26-flowered. Pedicels slender, 2″–3″ long. Flowers greenish-yellow. Segments of male perianth elliptical or oblong-obovate, acute, 2″ long, slightly longer than the stamens. Stamens 6 or 7; anthers a little shorter than the filament. Female flowers 8–10; stigmas somewhat shorter than the ovary. Fruiting pedicels 3″–4″ long; receptacle barely 1″ in diameter, without bracteoles. Berries 5 or 6 in number, globose, bluish-black, about 3″ in diameter. M. DeCandolle gives the receptacle as 5 mm. in diameter, but in none of our specimens are they over 1″.

Low or high ground and rocky places. Ontario to Virginia, Louisiana and Texas, west to Minnesota and Nebraska. May–July.

7. **Smilax Californica** A. Gray in Brew. and Wats. Bot. Cal. 2: 186 (1880).

Smilax rotundifolia var. *Californica* A. DC. Monog. Phan. 1: 75 (1878).

First collected by Hartweg (No. 2011) in the Sacramento Valley, California, in 1846–7, and noted in Benth. Pl. Hart. 341 (Dec. 1848) as "*Smilax rotundifolia* L.?"

Glabrous. Stem angled, often quadrangular on the branches, armed with scattered or numerous small weak black and bristly spines of different lengths. Petioles 2″–5″ long; stipular sheath with narrow smooth or ciliolate margins, ½ the length of the petiole. Blade thin, broadly ovate and cordate at base, or in the younger leaves lanceolate and rounded or somewhat acute at base, acute or abruptly cuspidate at the apex, entire or slightly erose-denticulate on the margins, lineolate, 5–7-nerved, 2′–5′ long and 9″–3½′ broad. Peduncles compressed, 8″–14″ long, 5–20-flowered. Pedicels 3″–4″ long. Flowers greenish-yellow. Segments of male perianth elliptical, 1- or obscurely 3-nerved, acute, 2″ long. Anthers ½ as long as the filament. Berries bluish-black, 5–15 in number, globose, about 3″ in diameter, 1–2 seeded.

McCloud's River and Butte and Humboldt counties, California; Kerbyville, Josephine county, Oregon (Thomas Howell).

8. **Smilax Pseudo-China** L. Sp. Pl. 1031 (1753).

Smilax hederæfolia Mill. Dict. fide A. DC. Monog. Phan. 1: 82.

Glabrous. Rootstock tuberous. Stem terete, branches angled, the lower part of them often beset with numerous straight needle-shaped prickles, the upper part and the branches unarmed or with occasional spines. Petioles 3″–12″ long; stipular sheath with even, smooth or ciliolate margins, ⅓–½ the length of the petiole, nearly always bearing tendrils. Blade rather thin, green on both sides, or sometimes glaucous beneath, ovate or round-ovate, often contracted in the middle or lobed at the base, obtuse cordate or subcordate at base, acute or cuspidate at the apex, commonly strongly lineolate, smooth or often bristly denticulate on the margins and nerves below, 2½′–4¾′ long and 1½′–3½′ broad, 7–9-nerved, occasionally in orbicular forms with 1 or 2 additional nerves on each side. The leaves on old plants sometimes become quite thick, orbicular in shape and 4′ or 5′ in diameter, or even broader than long. Peduncles flattened, 1′–3′ long, 12–40-flowered. Pedicels 3″–4″ long. Segments of male perianth oblong-ovate, acute, 2½″ long; stamens 6–10; anther as long as or longer than the filament. Buds oval in shape. Segments of female flowers elliptical, 1″–1½″ long. Berries black, 8–16 in number, globose, 2″–3″ in diameter, 1–3-seeded, on irregularly shaped receptacles 1″–2″ in diameter and apparently ebracteolate.

Smilax Pseudo-China may be distinguished from *S. hispida*, with which it is liable to be confounded, by its usually more numerous flowers and fruit, its stouter and longer peduncles, the frequent absence of prickles, which are never so numerous as in *hispida*, the firmer texture of the leaves, and the more prominent and generally more numerous nerves, the 3 middle ones running more closely together. Besides this the blades of *S. hispida* are seldom or never strictly cordate at the base, and never contracted or lobed, as sometimes occurs in *S. Pseudo-China*.

Dry or sandy soil. District of Columbia to Florida and Texas, west to Arkansas and Nebraska. March–August.

9. SMILAX BONA-NOX L. Sp. Pl. 1030 (1753).

Smilax Bona-nox β L. 1030 (1753).

Smilax hastata Willd. Sp. Pl. 4: 782 (1806).

Smilax pandurata Pursh, Fl. Am. Sept. 251 (1814).

Smilax tamnoides A. Gray, Man. Ed. 1, 485 (1848), not L.

Smilax hederæfolia (not Miller) and *S. senticosa*, Kunth, Enum. 5: 209 (1850).

Rootstocks tuberous; Dr. Burrows (MS. in Torr. Herb.) states that the Indians in Florida make them into meal and use it for bread or in soup, under the name "Coonte." Glabrous. Stem terete or slightly angled below; branches angled, often square. Prickles scattered or numerous, often stipular, often wanting on the branches, stout or occasionally acicular. Petiole 3″–6″ long, often spiny; stipular sheath ⅓ to ½ its length and frequently denticulate on the margins. Blade mostly coriaceous, sometimes rather thin, varying from broad-ovate to (more commonly) deltoid-hastate, hastate or panduriform (*S. pandurata* Pursh), green or shining on both sides, smooth or often denticulate or spiny on the margins and nerves beneath, especially in the southern hastate forms (*S. hastata* Willd., *S. bona-nox* β L.), acute or abruptly cuspidate at the apex, obtuse truncate cordate or semicordate at the base, pellucidly punctate and lineolate, 5–9-nerved, 1½′–4½′ long, 8″–2½′ wide. Peduncles slender, compressed, 7″–14″ long, 15–45-flowered. Pedicels 2″–4″ long. Segments of male perianth lanceolate, 2″–2½″ long; anthers as long as the filaments. Segments of female perianth 1″ long; ovary 3-celled, often only 1-ovuled; stigmas 1–3. Berries black, globular, 8–20 in number, 2″–3″ in diameter, mostly 1-seeded.

The leaves of this species are very variable in shape. They are sometimes merely ovate with an obtuse, abruptly cuspidate tip, more commonly deltoid-hastate with broad, rounded lobes at the base, sometimes constricted above the lobes, acute and cuspidate at the apex, running from this into narrow, hastate forms, with projecting, rounded lobes at the base, and an oblong, narrow, terminal lobe, the apex obtuse or acute and cuspidate. These narrow forms, are sometimes only 6″ broad across the basal lobes, and 3″ in width on the terminal lobe, and are often quite spiny-bristly on the margins. Others again are fiddle-shaped, with 2 broad, rounded lobes at the base, expanding above the contracted middle into a broad obtuse and cuspidate or acute upper lobe. The venation is often somewhat peculiar, the main reticulations being oblong, beginning low down on the blade, giving the appearance of a multitude of basal nerves, with secondary nerves as prominent as the primary. The nerves are 5–7 on the terminal lobe, and often from 2 to 4 additional ones on the basal lobes. The margins have a raised callous edge.

In specimens collected by Dr. Gattinger in Tennessee (Herb. University of Tenn.), the stem exhibits in places little cushions or pads of stellate hairs, and large flat spines having the same kind of hairs upon them. In these instances the branches are flexuous, with short nodes, as in *S. rotundifolia*. In other cases I have seen forms with these stellate hairs on the nerves of the leaf, and at the extremities of the spines, swamps and thickets.

Nantucket, Mass., to Florida and Texas, west to Missouri and Kansas. April–July.

10. SMILAX BEYRICHII Kunth, Enum. 5: 207 (1850).

Smilax ovata Ell. Bot. S. C. and Ga. 698 (1824), not Pursh.

Smilax auriculata Chapm. Fl. S. States, 476 (1860), not Walt. (?)

The name here given is adopted by M. De Candolle on the ground of the uncertainty attending the *S. auriculata* of Walter, but is by no means certain that this is not Walter's species, as his description, so far as it goes, applies very well, except that it may be doubtful what he means by "purple" berries.

Glabrous. Stem terete or obscurely angled below; branches angled, often square, flexuous. Spines rather stout, scattered, commonly wanting on the branches. Petioles 2″–6″ long, usually as long as or longer than the peduncles; stipular sheath with straight, even or ciliolate edges, occupying ½ or even more of the petiole. Blade thick, coriaceous, shining on both sides, strongly reticulated, varying from ovate, oblong-ovate and lanceolate to bilobate or dilated below, nearly always cuneate or acute at the base and acute and cuspidate at the apex, smooth on the margins and nerves, lineolate, the larger with 5–7 and the smaller with 3 nerves, 10″–4½′ long, 4″–2′ wide. The leaves are normally auriculate, but the lobes are often reduced to a basal dilatation or disappear altogether, leaving a lanceolate form. Peduncles stout, angled, 2″–5″ long, 7–40-flowered. Pedicels 3″–5″ long. Receptacle globose, 1″–2″ in diameter; bracteoles acuminate, ciliolate. Flower clusters numerous, fragrant. Segment of male perianth oblong-lanceolate, 2″–2½″ long; anthers usually ⅓ as long as the filament, sometimes ½ as long. Segments of female perianth 1½′ long; ovary 3-celled; 1 ovule in each cell; stigmas 3. Berries black, globose, 2″–3″ in diameter, 1–3-seeded.

M. De Candolle well notes that the scales of the lower branches are situated a little distance above the base of the branch, and not at the base as in other species.

A low, straggling species common in sand along the coast, trailing or running over small bushes, remarkable for the agreeable odor of its flowers. North Carolina to Florida and Alabama. Flowers, May–July. Fruit, November.

11. SMILAX SMALLII Morong. n. sp.

Glabrous. Stem and branches terete, striate, unarmed, mostly lying upon the ground, 6 to 8 feet in length, the tendrils grasping grasses and weeds. Petiole 2″–5″ long; stipular sheath with narrow membranous smooth-edged margins ⅔ as long as the petiole. Blade light green, shining above, obtuse or acute at the base, abruptly narrowing into an obtuse tip, sparsely lineolate, 5-nerved, 1½′–2¼′ long, 10″–1¾′ wide. Pedicels very unequal, 1″–4″ long. Receptacle small, globular; bracteoles minute, triangular. Segments of male perianth narrowly oblanceolate, 2″ long; about the length of the stamens; stamens 6; anthers ⅓ the length of the filament. Female flowers and fruit not seen.

Collected in the sand on the northern slope of the Stone Mountain, Georgia, July 17, 1893, by Mr. John K. Small, in whose honor it is here named.

‡‡ Fruit ripening the second year.

12. SMILAX LAURIFOLIA L. Sp. Pl. 1030 (1753).

Glabrous. Stem climbing high, stout, terete, striate, armed with strong straight prickles; branches angular, unarmed. Petiole stout, striate, 3″–8″ long; stipular sheath with even or ciliolate margins, ⅓ to ½ as long as the petiole. Blade thick, coriaceous, evergreen, feebly shining above, varying from elliptical to oblong-lanceolate, acute at base, acute or abruptly cuspidate at apex, smooth on the margins, minutely pellucid-punctate, 3-nerved, occasionally with an obscure marginal nerve on each side, 2′–4½′ long, 6″–2′ broad. Extreme forms with linear leaves 5½′ long and 3″ wide (var. *bupleurifolia* Delile) were collected by M. A. Curtis in South Carolina, and others 7′ long and 5½′ wide, from Florida, are in the herb. of Dr. Chapman. Peduncle usually shorter than the petiole, 2″–10″ long, stout, angled, 6–30-flowered. Pedicels 2″–3″ long. Receptacle globular, 1″–2″ in diameter; bracteoles minute, ovate. Segments of male perianth oblong, 2½″–3″ long; stamens a little shorter; anthers usually about ⅓ shorter than the filaments. Female flowers with oblong segments, 1½″–2″ long, 6 staminodia, an ovary commonly 1-rarely 2-celled, and with 1, rarely 2 stigmas. Berries black, ovoid, 2″–3″ in diameter, mostly 1-seeded, 8-12 in number, not maturing until the second year.

Swamps and moist thickets. Pine barrens, New Jersey to Florida, west to Texas and Arkansas. March–September.

†† Berries red.

13. SMILAX PUMILA Walt. Fl. Car. 244 (1788).

Smilax pubera Michx. Fl. Bor. Am. 2 : 238 (1803).

Smilax puberula Kunth, Enum. 5 : 193 (1850).

Rootstock tuberous, tubers small, sometimes massed together at base of stem, throwing out fibrous roots. Stem terete, unarmed, clothed with fuscous or rufescent pubescence, 1°–3° high, simple or sparingly branched. Petiole terete, 2″–7″ long, hairy; stipular sheath ¼–½ of the petiole, also pubescent, as well as the tendrils. Blade ovate or sometimes oval, acute and mucronate at the apex, cordate at base, softly white-pubescent beneath, scantily hairy or glabrous and shining above, pellucid-punctate and occasionally lineolate, 3–5-nerved, 2′–4′ long, 10″–2½′ wide. Peduncles 2″–8″ long, pubescent, 6–30-flowered. Pedicels 1″ long. Receptacle globose, very hairy, 1″–1½″ broad. Bud oblong-obovate, often scantily hairy. Segments of male perianth oblong, 1″–1½″ long, about the length of the stamens; anthers ⅓ the length of the filaments. Segments of female flower 1″ long; ovary ovoid, 1-celled, 1-ovuled; stigma solitary. Berries red, ovoid, pointed, 2½″–4″ long, 2″–2½″ broad, containing a single large oval light-yellow seed, maturing the second year.*

Dry, sandy soil and woodlands. South Carolina to Florida and Louisiana.

14. SMILAX HAVANENSIS Jacq. Amer. 262, *t. 179, f. 102* (1763).

Smilax dentata Willd. Sp. Pl. 4: 774 (1806).

Glabrous. Stem angled, flexuous, armed with numerous small stout hooked prickles; internodes short; often a low straggling vine, and often climbing high ("to the tops of trees," Blodgett). Sometimes the stems are naked or very sparsely armed. Petioles 1″–3″ long, about equal to the peduncle; stipular sheath with smooth or ciliate, sometimes sparsely bristly margins, occupying nearly the whole length of the petiole. Blade rigid, roundish, ovate, elliptical or mostly oblong, narrowed or rounded, occasionally subcordate at the base, mucronate at the apex, or often emarginate as well as mucronate, commonly spiny on the callous-nerved margins and often so on the midrib beneath, opaque, 3–5-nerved, or 7-nerved from the base, 1′–2′ long, 4″–14″ wide, increasing in the older leaves to 4′ by 2¼′. Peduncles thick, angled, 1″–2″ long, or often apparently none, 4–30-flowered. Pedicels ½″–1″ long. Receptacle 1″–3″ broad, depressed, globose; bracteoles minute, ovate or acuminate. Segments of the male perianth, which I have not seen, are, according to M. De Candolle, ½″–¾″ long, oblong; stamens ½ shorter; anthers the length of the filament. The female flowers have segments ½″ long; ovary 3-celled, 2–3-ovuled; stigmas 2–3. Berries globose, 2″–3″ in diameter.

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* We owe our knowledge of this fact to Mr. E. E. Sterns whose articles in Bull. Torr. Club, 15: 162 and elsewhere contain matters of great interest in regard to various species of *Smilax*. It is to be regretted that the expressed intention of this acute observer to publish a revision of the North American species was never carried into effect.

I have not seen fresh berries; they are described as being red. Dried herbarium specimens at Columbia College are old and faded, but have a ruddy tinge. M. De Candolle says that they blacken in drying. Grisebach* calls them "purple."

The plant has migrated from the West Indies, where it is common, and has been collected by Rugel and A. H. Curtiss near the coast in Southern Florida, by Blodgett at Key West, and by Simpson on Little Pine Key. Extends into Mexico. Flowers, March.

SMILAX WALTERI Pursh, Fl. Am. Sept. 249 (1814).

Smilax caduca, Ell. Bot. S. C. & Ga. 2: 701 (1824), not L.

Glabrous. Stem angled, prickly near the base; branches often square, commonly unarmed. Petioles 2″–6″ long, stout, angular; stipular sheath ¼–⅓ the length of the petiole, the margins often denticulate. Blade broad-ovate, lanceolate, rarely obtusely 2-lobed at the base (as in specimens collected by A. H. Curtiss, near Jacksonville, Florida, No. 2863), cordate, subcordate, rounded or abruptly acute at base, cuspidate at the apex, smooth on the margins, sparsely lineolate, 5–7-nerved, 2′–5′ long, 10″–3¼′ wide. Peduncles 2″–5″ long, flattened, thickening with age, 6–15-flowered. Receptacle depressed-globose, 1½″ broad, or often quite irregular in shape; bracteoles few, acuminate. Pedicels very slender, 2″–3″ long. Segments of male perianth oblong, 3″–4″ long, ¼–⅓ longer than the stamens. Anthers ¼–⅓ shorter than the filaments. Female flowers with perianth segments 1½″–2″ long, ovary 3-celled, 3-ovuled. Berries coral red, globose, 3″–4″ in diameter, 2–3-seeded, maturing the first year.

Pine barrens and swamps. New Jersey to Florida, Tennessee and Louisiana. Flowers, April–June. Fruit, September–November.

16. SMILAX LANCEOLATA L. Sp. Pl. 1031 (1753).

Smilax ovata Pursh, Fl. Am. Sept. 249 (1814).

Glabrous. Stem and branches terete, branchlets subangular, mostly unarmed; climbing over trees sometimes for 30 feet. Petiole 1″–2″ long; stipular sheath about ½ the length of the petiole, margins narrow, parallel, entire or ciliolate. Blade usually rather thin in texture, ovate or more commonly lanceolate, acute at the base, acute or acuminate at the apex, smooth on the margins, shining above, sparingly lineolate, 5–7-nerved, 2′–3½′ long, 6″–20″ wide. Peduncles thick, angled, 3″–8″ long, 8–40-flowered.

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* Fl. Brit. W. I. Islands, 586.

Pedicels 2″–7″ long. Receptacle globose, about 1″ broad, or sometimes conical and 2″ long. Pedicels 2″–2½″ long, inserted among ovate or acuminate ciliolate bracteoles. Segments of male perianth narrow, oblong, acute, about 2″ long; anthers shorter than the filaments. Female flowers not seen. Ovary 3-celled, 3-ovuled; stigmas 3. Berries dark red, globose, 2″–3″ in diameter, usually 2-seeded, 4–10 in number, maturing the first year.

The reduction of *S. ovata*, Pursh to this species is made on the authority of Dr. Asa Gray, who, as appears from manuscript notes in the Harvard Herbarium, examined in 1881 the specimens in the Herbaria of Enslen and Sherard upon which Pursh founded his species, and declares positively that they are *Smilax lanceolata.* M. De Candolle in his monograph retains *Smilax ovata* and *S. lanceolata* as distinct species, but he appears to have based his *ovata* principally upon the description of Elliott, and specimens from Elliott in Herb. Webb. There cannot be much doubt, however, that the *ovata* of Elliott is an ovate-leaved form of *S. Beyrichii* Kunth.

Virginia to Florida, west to Arkansas and Texas, March–August.

17. SMILAX MEGACARPA Morong n. sp.

Glabrous, excepting traces of a fine white pubescence on some of the scales beneath the branches. Stem terete, striate; branches angular or subangular, a little flexuous. Petiole 2″–4″ long, thick, striate; stipular sheath from ¼ to ½ its length, with narrow ciliolate or smooth parallel margins. Blade thick, coriaceous, elliptical, rounded or sloping at base, obtuse and abruptly acute or cuspidate at the apex, dull green on both sides, margins smooth, nerves not prominent, 5–7, the midnerves often apparently made up of 2 or 3, the lateral ones branching off from it above, minutely pellucid-punctate, but not lineolate, the smaller 2½′–3′ long and 6″–1′ broad, the larger 3½′–4′ long and 1½′–2′ broad. The leaves strongly resemble those of *S. laurifolia* in shape, color and texture. Peduncles of old umbels, from which the flowers have fallen are ½″–2″ long, thick, angular, the empty foveolæ apparently 6–10 in number; fruiting peduncles flattened, 6″–8″ long. Pedicels 3″–4″ long. Receptacle irregular in shape or globose, 1″–1½″ broad. Flowers not seen. Berries globose, red, 4–6 in number, very large, 3″–5″ in diameter, 3-seeded.

This plant was collected in fruit only by Capt. John Donnell Smith, February 11, 1882, in swamps, Duval County, Florida.

It does not agree either with *S. laurifolia* or *S. lanceolata*, to both of which it bears a resemblance in certain particulars.

MEXICAN AND CENTRAL AMERICAN SPECIES.

1. SMILAX ACUTIFOLIA Schlecht. Linnæa, **18**: 449 (1844).

Very smooth and glabrous. A plant apparently unarmed, with subcoriaceous, curvilinear-acuminate blades, broadly rounded at the base, 5–7-nerved, 3¾′–4¾′ long and 1¼′–2½′ broad at the base. Peduncles always longer than the petiole. Pedicels ½ as long as the peduncles. Berries depressed sub-globose, 5″ in diameter.

South Mexico, near Angangueo (Schiede) and near El Banco (Ehrenberg).

2. SMILAX ANGUSTIFLORA A. DC. Monog. Phan. **1**: 67 (1878).

Rufescent-tomentose. Blades ovate-oblong, broadly cordate at base, not shining, 7-nerved, 4½′–5′ long, 1½′–2′ broad. Male peduncles 7″–10″ long, 20–40-flowered. Female flowers and fruit not known. Distinguishable from *S. tomentosa* by its paler color, its thinner, less ovate and duller blades with a broader sinus, its longer peduncles, very narrow buds and blunt anthers.

Costa Rica, at Alto de la Cruz, near Azari (Hoffman).

3. SMILAX ARISTOLOCHIÆFOLIA Mill. Gard. Dict. Ed. 8, No. 7 (1768).

S. Milleri Steud. Nomencl. Bot.

All that is known of this species is given by Miller, who describes the stem as climbing 30–40 feet, and the blades as thick, rigid, unarmed, tri-nerved, 7′ long and auricled at the base.

Near Vera Cruz, Mexico.

4. SMILAX BONA-NOX WRIGHTII A. DC.

The form with ovate-acute blades, round-lobed at the base.

Mexico, without locality (Pavon), near Jalapa (Galeotti) and Zinapan (Coulter).

5. SMILAX BONA-NOX SENTICOSA A. DC.

Form with rigid, often aculeate blades, nerves or petiole often aculeate, and fruit-bearing peduncles twice as long as the petiole.

South Mexico, near Puente de Dios (Ehrenberg), Orizaba and Huatasco (F. Müller).

6. SMILAX BOTTERII A. DC. Monog. Phan. **1**: 89 (1878).

Glabrous. Lower branches quadrangular, armed with scattered short black prickles. Petioles 2″–4″ long; stipular sheath nearly ½ the length of the petiole, margins denticulate or smooth. Blade oblong-ovate, acute or somewhat obtuse at base, or when older cordate, shining above, pellucid-punctate and lineolate, 7–9-nerved, the younger 1½'–2½' long, the older 2¾'–3½' long and about as broad. Peduncles 2"–5" long, 20–30-flowered. Ovary obovoid, 3-sulcate. Stigmas 3, linear, obtuse, erect or recurved, about ¼ as long as the ovary. Younger fruit only known, the berries are borne on pedicels about 5" long.

This species when the quadrangular branches are not seen is, according to A. DC., difficult to separate from *S. invenusta* and *S. Moranensis*.

Mexico, around Orizaba (Botteri, No. 467), and the valley of Mexico (Bourgeau, Nos. 237 and 1131).

7. **Smilax Candelariæ** A. DC. Monog. Phan. 1: 70 (1878).

Branches terete, the younger densely rufescent-tomentose, at last glabrate. Petioles 3"–5" long, pubescent; stipular sheath ⅓–½ the length of the petiole. Blade oval, oblong or ovate-acute, obtuse at base and later subcordate, pubescent beneath, sparsely tomentose on the nerves above, 7–11-nerved, opaque, 3½'–8½' long, 1¼'–4¾' broad. Flowers unknown. Fruit-bearing peduncles 1" long, tomentose. Pedicels 4"–5" long, pilose. Berries black, globose, nearly 5" in diameter, 1–3-seeded.

8. **Smilax cognata** Kunth, Enum. 5: 175 (1850).

Attributed by Kunth to Puerto Alegro, Mexico, is regarded by A. DC. as probably confined to Brazil, since no such place as Puerto Alegro is known in Mexico, and Kunth's specimens were cutivated at Berlin.

9. **Smilax cordifolia** H. and B.; Willd. Sp. Pl. 4: 778 (1806).

Branches flexuous, subterete or angular, commonly unarmed, clothed, as also the leaves with white evanescent hairs. Petiole 4"–5" long; stipular sheath ¼–⅓ length of petiole, the margins denticulate. Blade firm but not coriaceous, ovate-acute, cordate and broadly rounded at the base, cuneate near the petiole, mucronate at the apex, 7–9-nerved, 2½'–3¼' long, 1½'–2¾' broad. Peduncles 5"–9" long, 8–24-flowered. Pedicels 2"–3" long, inserted among very small lanceolate bracteoles. Receptacle globose, ½"–1" in diameter. Berries black, 1–2-seeded, 2–7 in number.

South Mexico, near Jalapa, La Bandanilla, Papantla and other places.

10. SMILAX DENSIFLORA A. DC. Monog. Phan. 1 : 88 (1878).

Glabrous. Unarmed. Branches terete, or the upper angled and striate. Petioles 2″–5″ long. Blade ovate-acuminate, obtuse or subcordate at base, the margins slightly erose-denticulate, 5-nerved, 1¼′–2′ long, 7″–10″ broad. Peduncles 2″–7″ long, densely 10–12-flowered. Berries not known.

Mexico, Province of Toluca.

11. SMILAX DENSIFLORA CHRISTMARENSIS A. DC.

Blade 7-nerved; peduncles twice as long as the petiole.

South Mexico, around San Miguel.

12. SMILAX DISCOLOR Schlecht. Linnæa, **18**: 454 (1844).

Very smooth and glabrous. Stems subterete, the branches subangular and glaucescent, rarely armed. Petioles 4″–6″ long. Blade oval, dilated at base or elongated-triangular, acute at the apex, pruinose or white-glaucescent beneath, 5-nerved, 2¼′–3¼′ long, 1′–2½′ broad, sometimes increasing to 10′ or 12′ long and 3′ broad at the base. Peduncles 8″–12″ long, compressed, angulate. Pedicels 3″ long. Fruit not known.

13. SMILAX DOMINGENSIS Willd. Sp. Pl. **4**: 783 (1806).

Specimens apparently belonging to this species are in the Herbarium of Capt. John Donnell Smith, though not cited by De Candolle or Hemsley as occuring in Mexico. They correspond very fairly with Wright's Cuban plants in the Herbarium of Columbia College, and almost precisely with De Candolle's description of the species.

Glabrous. Branches terete below, subangular above, unarmed. Petiole 4″–7″ long; stipular sheath about ¼ the length of the petiole. Blade elliptical, acute at base, acute or acuminate at the apex, shining on the upper surface, pellucidly punctate, 5–7-nerved, the marginal nerves closely approximate, 2½′–3½′ long, 8″–22″ broad. Peduncles 1″–2″ long, thick, angled, 10–20-flowered. Receptacle globose; bracteoles minute, acuminate, ciliolate. Pedicels of male flowers about 2″ long; bud ovoid or oblanceolate; segments of perianth elliptical, obtuse, 2″ long; anthers much shorter than the filaments. Berries black, globose, on pedicels 3″–4″ long, about 2″ in diameter.

Collected by Botteri at Orizaba. Common in St. Domingo and Cuba.

14. SMILAX ERYTHROCARPA Kunth, Enum. **5**: 234 (1850).

Glabrous. Stems terete, unarmed, or sometimes remotely armed with small straight prickles. Petioles 8″–10″ long. Blade coriaceous, oblong-ovate, cordate or obtuse at the base, short-acuminate, 7-nerved, 3¼′–4′ long, 1½′–2′ broad. Distinguished from all other Mexican species, according to Kunth, by the length of its peduncles, which are nearly 2½′ long. Berries red, shorter than the pedicels.

15. SMILAX GLAUCA Walt. Fl. Car. (1788).

South Mexico, near Oaxaca and at Zongolica.

16. SMILAX GLAUCOCARPA Schlecht. Linnæa, **18**: 450 (1844).

Stem very smooth, terete, sparsely armed. Petiole 2″–3″ long. Blade with rounded or narrowed base, subfalcate, very narrowly acuminate, glaucous-green, 5-nerved, 2½′–3¼′ long, 9″–14″ broad at the base. Male flowers unknown. Female pedicels 1″–2″ long; the perianth segments about 1″ long. This seems to be a doubtful species, as no specimens are found in any European or American Herbarium.

According to Schlechtendal, occurring at the Hacienda del Carmen and Mineral del Monte, in South Mexico.

17. SMILAX HAVANENSIS Jacq.

South Mexico, mountains west of Jalapa.

18. SMILAX HISPIDA Torr.

Assigned doubtfully to Mexico by Hemsley.

19. SMILAX INVENUSTA Kunth, Enum. **5**: 234 (1850).

Glabrous. Stem terete, unarmed. Petiole 4″–18″ long; stipular sheath with very narrow margins, ¼–⅓ the length of the petiole. Blade ovate, oval or elliptical, rounded, sometimes cordate or subcordate at base, margins entire, 7–9-nerved, 3′–6′ long, 1½′–4′ broad. Specimens in the Harvard Herbarium collected by Botteri at Orizaba, have flexuous and angled branches, and ovate-lanceolate, subcordate blades 4½′ long and 2½′ wide. Peduncles angular, often compressed, 4″–7″ long. Pedicels nearly filiform, 2″–4″ long. Male flowers with very narrow, elliptical, acute segments, 2½″–3″ long; filaments about the length of the anthers; Berries black, globose, 1–2-seeded, 6–8 in number.

South Mexico, near Orizaba and Jalapa. Guatemala, near Coban, Coll. Lehman (Herb. J. D. Smith).

20. SMILAX INVENUSTA ARMATA A. DC.

A form with occasional prickles on the flower-bearing branches and branchlets.

More common than the type. South Mexico, Jalapa; Guatamala, Coban (Herb. J. D. Smith).

21. SMILAX JALAPENSIS Schlecht. Linnæa, **18**: 447 (1844).

Very smooth. Stem terete, sparingly furnished with prickles. Petiole ahout 6″ long. Blade broad-ovate, rounded or subcordate at base, acuminate, glaucous-green underneath, 7-nerved, 1¼′–3′ long, 1′–2½′ wide. Peduncles 8″ 11″ long. Pedicels 3″–4″ long. Ripe fruit unknown.

South Mexico, Jalapa.

22. SMILAX MEDICA Schlecht. Linnæa, **18**: 447 (1844).

Rhizome consisting of a large crown of consolidated tubers, which throw out a number of stems, and numerous roots 1″–2″ in thickness and sometimes 3 feet long. These roots are pressed over the crown, dried and exported under the commercial name, "Vera Cruz Sarsaparilla."

Glabrous. Stems bluntly angular, armed with short stout prickles; branches very flexuous, sub-terete or angular, commonly unarmed. Petioles 5″–2′ long, occasionally bearing a few straight prickles; stipular sheath with narrow wings, ⅓–½ as long as the petiole. Blade ovate-hastate or oblong-hastate, cordate, with rounded lobes, often slightly constricted above the lobes, varying to oblong-elliptical with an acute base, acute at apex, pellucid-punctate and lineolate, 5–7-nerved or sometimes with 1 or 2 additional marginal nerves on each side, 4′–8′ long, 2′–4½′ broad. Peduncles compressed, 5″–12″ long, 8–25-flowered, often rising from the axils of the bracts (var. *bracteata* A. DC.). Pedicels flattened, 4″–5″ long. Berries red, globose, about the length of the pedicel, often 3-seeded.

South Mexico, Rafantla and near Tantoyuca, Orizaba and elsewhere.

23. SMILAX MEXICANA Kunth, Enum. 5: 167 (1850).

Glabrous. Branches flexuous, angular, sparsely armed with recurved prickles. Petiole 3″–7″. Blade thick, coriaceous, elliptical-ovate, rounded or subcordate at base, acute or acuminate and mucronate at the apex, here and there spiny on the midnerve beneath, 5–7-nerved, 2′–4½′ long, 8″–2¼′ wide. Old leaves are sometimes nearly oval, 4′ long and nearly 3′ broad, abruptly acute. Peduncles 1″–3″ long, 10–50-flowered. Pedicels 1″–3″ long. Berries black, 3–6 in number, 1–2-seeded.

South Mexico, near Tampico, Misantla and Colipa. Guatemala, Acatepeque (Herb. J. D. Smith).

24. SMILAX MEXICANA COSTARICÆ A. DC.

Leaves always unarmed. Flowers said to be intensely red and fragrant.

Mexico, Vera Cruz (F. Müller), Orizaba, Tampico, Misantla and other places. Costa Rica, near San Jose. Panama.

25. SMILAX MOLLIS Willd. Sp. Pl. 4: 785 (1806).

All the parts densely clothed with soft rufescent hairs, the leaves becoming glabrate. Stem slender, terete, unarmed. Petiole stout, 5″–7″ long. Blade elliptical, ovate or oblong-ovate, cordate, acute or obtuse and mucronate at the apex, 7–9-nerved, 3′–5′ long, 1¾′–3′ broad. Specimens in Columbia College Herbarium, collected by Dr. Halsted near Jalapa, Mexico, have oblong-lanceolate, acute blades, 3¼′–10¾′ long and 1′–1¾′ wide. Peduncles stout, terete, 5″–10″ long, or even 14″, densely 20–50-flowered. Pedicels ½″–1″ long. Bud of male flower obovoid, acute at the base, sometimes furnished with long hairs. Berries said to be red when fresh, appearing black in herbarium specimens.

South Mexico, Orizaba, Jalapa and elsewhere. Common in the West Indies.

26. SMILAX MORANENSIS Mart. & Gal. Bull. Acad. Brux. 9: 2 (1842).

Rhizome small, scarcely distinct from the lower part of the stem. Glabrous. Stem terete, armed. Petiole 2″–3″, or sometimes 8″ long. Blade more or less ovate, obtuse or subcordate at base, long lanceolate, with an acute tip, margins erose-denticulate, 5–7-nerved, 2′–3½′ long, 5″–19″ broad. Peduncle 2″–6″ long, 9–15-flowered. Pedicels 2″–4″ long. Receptacle scarcely ¼″ broad, ebracteolate. Berries black, globose, 2″–3″ broad.

Mexico, between Chico and Chapula, on the peak of Orizaba and near the city of Mexico.

27. SMILAX MULTIFLORA, Mart. & Gal. Bull. Acad. Brux. 9: 2 (1842).

Stem terete, unarmed. Petiole 1′ long. Blade ovate, subacuminate, triple-nerved. Umbels densely many-flowered. Peduncles 2″–3″ long, scarcely longer than the petiole.

Placed by De Candolle among "species dubiæ."

Said to have been collected in the woods at Chinantla, Province of Oaxaca.

28. SMILAX OBTUSA Benth. Bot. Voy. Sulph. 175 (1845).

Glabrous. Branches angular, unarmed. Petiole 2″–5″ long. Blade coriaceous, oblong, more or less obtuse at base, obtuse and often mucronulate at the apex, 5-nerved, 1¼′–2½′ long and 5″–

6″ broad. Peduncle about equal to the petiole. Berries globose, shortly pedicellate, 2″ in diameter.

Scarcely to be separated from *S. Wagneriana,* which see. Manzanilla Bay, Mexico.

29. SMILAX OFFICINALIS H. B. K. Nov. Gen. 1: 271 (1815).

Rootstock large and long, tuberous or with thickened nodes whence proceed numerous roots, 6–8 feet long, which form the officinal or "Jamaica" Sarsaparilla of commerce.

Glabrous. Stems numerous from the same rootstock, angular, armed with curved prickles; branches flexuous, cylindrical at first, becoming strongly quadrangular, armed like the stem or often unarmed. Petiole 2″–6″, becoming sometimes 2′ long, often twisted, quadrangular, often armed with a few straight prickles beneath. Blade coriaceous, oblong-ovate, cordate, abruptly acute or obtuse with a small hard central point at the apex, 7-nerved, 5′–8′ long, 2′–2½′ wide, the old leaves sometimes reaching a length of 12′ and a breadth of 6½′. Flowers and fruit not known.

Attributed to Mexico by Presl. Panama, Volcan de Chiriqui.

30. SMILAX PANAMENSIS Morong n. sp.

Stem terete, unarmed, slightly pubescent here and there, in specimens examined the female plant manifestly rusty-pubescent, especially at the nodes, as well as on the peduncles and tendrils, becoming glabrate; branches flexuous. Pedicels 6″–8″ long; stipular sheath about ⅓ as long as the petiole, with narrow, even wings, often tendril-bearing. Blades glabrous, oblong-ovate or lanceolate, rounded, acute or semi-cordate at the base, entire, pellucid-punctate, 5–7-nerved, the older ones 4′–5½′ long, 1½′–2½′ broad. Male peduncle flattened, solitary, sometimes 2–3-branched or often 2 or 3 from the same axil, 8″–12″ long, frequently bearing scales, 8–10-flowered. Pedicels very slender, flattened, 2″–5″ long. Receptacles globose, ½″–1″ in diameter; bracteoles acuminate, ciliolate. Flower buds elliptical, about 2″ long; segments of perianth elliptical, acute or obtuse, 2″–3″ long; stamens 5 and 6, included; anthers a little longer than the filaments. Fruit-bearing peduncle terete, occasionally pubescent, 12″–14″ long, and judging from the foveolæ 30–40-flowered. Margins of the foveolæ and the bracteoles woolly-pubescent. Berries ovoid, 4″–5″ long, black with a reddish tinge in the dried specimens, 1-seeded. As the male flowers were collected in October and the fully ripe fruit in November of the same year, it would suggest the probability that the berries ripen in the second year.

Collected by S. Hayes (No. 63, 68 and 209) at the Gatun Station on the Panama Railway, October and November, 1859.

31. SMILAX PAPYRACEA Duham. Arb. Ed. Mich. 1: 242 (1801).

Rhizome thickened at the summit with tubers, about 10″ thick, sending off long roots into the ground. These according to Grisebach (Mart. Fl. Bras. 3: Pt. 2, 5) furnish the Brazilian Sarsaparilla, known in common as " Para " or " Lisbon Sarsaparilla."

Glabrous. Stem sharply quadrangular or 5–6 angled, thickly beset with scale-like prickles upon the angles. Petiole 5″–10″ long. Blade papyraceous in texture, oblong-elliptical, rounded or subcordate at base, cuneate at the petiole, acuminate-cuspidate at the apex, 5-nerved, 4′–6½′ long, 2′–4′ long. Flowers and fruit unknown.

Guatemala, Volcan de Fuego.

32. SMILAX ROTUNDIFOLIA L.

According to De Candolle, collected in Mexico by Pavon, locality not given, specimens apparently of this species are in the Herbarium of Columbia College, ex herb. John Donnell Smith, collected by Heyde and Lux at San Miguel Uspatan, Guatemala, No. 3526.

33. SMILAX SCHLECHTENDALII Kunth, Enum. 5: 224 (1850).

Glabrous. Stem stout, terete, striate, unarmed; branches terete or angular, slightly flexuous. Petiole 4″–6″ long; stipular sheath about ⅓ the length of the petiole, the margins narrow and ciliolate. Blade coriaceous, lanceolate or oblong-ovate, cuneate at the petiole, abruptly acuminate at the apex, pellucidly punctate, 5-nerved or with an additional marginal nerve on each side, 2½′–4′ long, 1¼′–2′ broad, the marginal nerves closely approximate. De Candolle states that the leaves are shining on the upper surface. They are dull in the specimens which I have examined. The reticulations are remarkably small and close. Peduncles angular-extremely short, sometimes apparently none, the longest fruits bearing peduncles less than 1″ long, 8–30 flowered. Pedicels 3″–6″ long. Berries black in herbarium specimens, globose, 3″–4″, broad, 2–3-seeded.

Reported from Orizaba, Valley of Cordova and other places in Mexico. Specimens in Herb. John Donnell Smith, Coll. E. Kerber at Fortin, near Orizaba, March, 1883 (No. 361).

34. SMILAX SPINOSA Mill Gard. Dict. no. 8 (1768), not Poir.

This is said to have a terete, unarmed stem, ovate-lanceolate leaves, the nerves spiny, about 4½′ long and 2½′ wide, but it is regarded as a doubtful species by De. Candolle.

South Mexico, near Vera Cruz.

35. SMILAX SUBPUBESCENS A. DC. Monog. Phan. 1 : 69 (1878).

Branches unarmed or furnished with short, straight prickles, the lower terete and glabrous, the upper angular and pubescent at the extremities. Petioles 7″–9″ long. Blade coriaceous, glabrous, ovate-acuminate, obtuse or subcordate at base, acuminate at the apex, pellucid-punctate and sparingly lineolate, 7–9-nerved, 2¼′–3½′ long, 1′–2′ broad. Fruit-bearing peduncles 4″–8″ long, red-pubescent, at length glabrate, 5–7-fruited. Pedicels 5″ long, puberulent. Berries globose, 3″–4″ in diameter.

Fruiting specimens which appear to belong to this species are in the herbarium of John Donnell Smith, collected by Kerner (no. 188), at Atoyac, in the Province of Vera Cruz, Mexico. In this case the lower portions of the branches as well as the petioles exhibit a rufous pubescence, which, however, disappears in time, leaving them glabrate. The blades are all subcordate, and strongly lineolate. Berries 6–10. M. De Candolle does not indicate the color of the fruit, but in these specimens the berries have a decidedly reddish tinge, and yield 2–3 seeds.

South Mexico, region of Orizaba.

36. SMILAX TOMENTOSA H. B. K. Nov. Gen. 1: 272 (1815).

Stem terete, unarmed, the younger branches fulvous-tomentose, becoming glabrate. Petioles 2″–3″ long, the older ones becoming 9″–12″ in length. Tendrils pubescent. Blade coriaceous, pubescent above, ferruginous-tomentose beneath, cordate-ovate, acuminate, pellucid-punctate but not lineolate, 9-nerved, the younger 2′–3½′ long and 9″–2⅓ broad, becoming with age 5′ long and 3½′ broad. Male peduncle 1″–2″ long, tomentose, 30–40-flowered. Pedicels 3″–4″ long, the younger tomentose. Female peduncle longer, and the pedicels slightly shorter than in the male. Berries unknown.

Panama, Volcan de Chiriqui.

37. SMILAX WAGNERIANA A. D. C. Monog. Phan. 1: 143 (1878).

Glabrous. Branches smooth, angular, unarmed. Petiole 2″–5″ long. Blade subrigid, ovate-lanceolate, rarely oblong, acute or later obtuse at the base, narrowed or obtuse-mucronulate at the apex, opaque, 5-nerved, 2′–3¼′ long, 7″–12″ broad. Male peduncle ⅓″–1″ long, 25–35-flowered. Pedicels very slender, 2″–3″ long. Female flowers and berries unknown.

Panama, Province of Chiriqui.